

CLAIMS

What is claimed is:

1. An isolated nucleic acid molecule comprising a nucleic acid having a nucleotide sequence which encodes an amino acid sequence exhibiting at least 40% sequence identity to an amino acid sequence encoded by

(a) a nucleotide sequence described in Table 1 or a fragment thereof; or

5 a complement of a nucleotide sequence shown in Table 1 or a fragment thereof.

2. An isolated nucleic acid molecule comprising a nucleic acid having a nucleotide sequence which exhibits at least 65% sequence identity to

(a) a nucleotide sequence shown in Table 1 or a fragment thereof; or

(b) a complement of a nucleotide sequence described in Table 1 or a fragment thereof.

3. An isolated nucleic acid molecule comprising a nucleic acid having a nucleotide sequence which exhibits at least 65% sequence identity to a gene comprising

(a) a nucleotide sequence shown in Table 1 or a fragment thereof; or

(b) a complement of a nucleotide sequence described in Table 1 or a fragment thereof.

4. An isolated nucleic acid molecule which is the reverse of the isolated nucleotide sequence according to claim 1, such that the reverse nucleotide sequence has a sequence order which is the reverse of the sequence order of said isolated nucleotide sequence according to claim 1.

5. An isolated nucleic acid molecule comprising a nucleic acid capable of hybridizing to a nucleic acid having a sequence selected from the group consisting of:

(a) a nucleotide sequence which is shown in Table 1; and

(b) a nucleotide sequence which is complementary to a nucleotide sequence shown in Table 1;

under conditions that permit formation of a nucleic acid duplex at a temperature from about 40°C and 48°C below the melting temperature of the nucleic acid duplex.

6. The nucleic acid molecule according to claim 1, wherein said nucleic acid comprises an open reading frame.

7. The isolated nucleic acid molecule of claim 1, wherein said nucleic acid is capable of functioning as a promoter, a 3' end termination sequence, an untranslated region (UTR), or as a regulatory sequence.

8. The isolated nucleic acid molecule of claim 7, wherein said nucleic acid is a promoter and comprises a sequence selected from the group consisting of a TATA box sequence, a CAAT box sequence, a motif of GCAATCG or any transcription-factor binding sequence, and any combination thereof.

9. The isolated nucleic acid molecule of claim 7, wherein the nucleic acid sequence is a regulatory sequence which is capable of promoting seed-specific expression, embryo-specific expression, ovule-specific expression, tapetum-specific expression or root-specific expression of a sequence or any combination thereof.

10. A vector construct comprising a nucleic acid molecule according to claim 1, wherein said nucleic acid molecule is heterologous to any element in said vector construct.

11. A vector construct comprising:

- (a) a first nucleic acid having a regulatory sequence capable of causing transcription and/or translation; and
- (b) a second nucleic acid having the sequence of the isolated nucleic acid molecule according to claim 1;

wherein said first and second nucleic acids are operably linked and

wherein said second nucleic acid is heterologous to any element in said vector construct.

12. The vector construct according to claim 11, wherein said first nucleic acid is native to said second nucleic acid.

13. The vector construct according to claim 11, wherein said first nucleic acid is heterologous to said second nucleic acid.

14. A vector construct comprising:

- (c) a first nucleic acid having the sequence of the isolated nucleic acid molecule according to claim 7; and
- (d) a second nucleic acid;

wherein said first and second nucleic acids are operably linked and

wherein said first nucleic acid is heterologous to any element in said vector construct.

15. The vector construct according to claim 14, wherein said first nucleic acid is native to said second nucleic acid.

16. The vector construct according to claim 14, wherein said first nucleic acid is heterologous to said second nucleic acid.

17. A host cell comprising an isolated nucleic acid molecule according to claim 1, wherein said nucleic acid molecule is flanked by exogenous sequence.
18. A host cell comprising a vector construct of claim 10.
19. A host cell comprising a vector construct of claim 11.
20. A host cell comprising a vector construct of claim 12.
21. A host cell comprising a vector construct of claim 13.
22. A host cell comprising a vector construct of claim 14.
23. A host cell comprising a vector construct of claim 15.
24. A host cell comprising a vector construct of claim 16.
25. An isolated polypeptide comprising an amino acid sequence
- (a) exhibiting at least 40% sequence identity of an amino acid sequence encoded by a sequence shown in Table 1 or a fragment thereof; and
- (b) capable of exhibiting at least one of the biological activities of the polypeptide encoded by said nucleotide sequence shown in Table 1 or a fragment thereof.
26. The isolated polypeptide of claim 25, wherein said amino acid sequence exhibits at least 75% sequence identity to an amino acid sequence encoded by a sequence shown in Table 1 or a fragment thereof.
27. The isolated polypeptide of claim 25, wherein said amino acid sequence exhibits at least 85% sequence identity to an amino acid sequence encoded by a sequence shown in Table 1 or a fragment thereof.
28. The isolated polypeptide of claim 25, wherein said amino acid sequence exhibits at least 90% sequence identity to an amino acid sequence encoded by a sequence shown in Table 1 or a fragment thereof.
29. An antibody capable of binding the isolated polypeptide of claim 25.
30. A method of introducing an isolated nucleic acid into a host cell comprising:
- (a) providing an isolated nucleic acid molecule according to claim 1; and
- (b) contacting said isolated nucleic acid with said host cell under conditions that permit insertion of said nucleic acid into said host cell.
31. A method of transforming a host cell which comprises contacting a host cell with a vector construct according to claim 10.
32. A method of transforming a host cell which comprises contacting a host cell with a vector construct according to claim 11.
33. A method of transforming a host cell which comprises contacting a host cell with a vector construct according to claim 12.

34. A method of transforming a host cell which comprises contacting a host cell with a vector construct according to claim 13.
35. A method of transforming a host cell which comprises contacting a host cell with a vector construct according to claim 14.
36. A method of transforming a host cell which comprises contacting a host cell with a vector construct according to claim 15.
37. A method of transforming a host cell which comprises contacting a host cell with a vector construct according to claim 16.
38. A method of modulating transcription and/or translation of a nucleic acid in a host cell comprising:
 - (a) providing the host cell of claim 17; and
 - (b) culturing said host cell under conditions that permit transcription or translation.
39. A method for detecting a nucleic acid in a sample which comprises:
 - (a) providing an isolated nucleic acid molecule according to claim 1;
 - (b) contacting said isolated nucleic acid molecule with a sample under conditions which permit a comparison of the sequence of said isolated nucleic acid molecule with the sequence of DNA in said sample; and
 - (c) analyzing the result of said comparison.
40. The method according to claim 39, wherein said isolated nucleic acid molecule and said sample are contacted under conditions which permit the formation of a duplex between complementary nucleic acid sequences.
41. A plant or cell of a plant which comprises a nucleic acid molecule according to claim 1 which is exogenous to said plant or plant cell.
42. A plant or cell of a plant which comprises a nucleic acid molecule according to claim 1, wherein said nucleic acid molecule is heterologous to said plant or said cell of a plant.
43. A plant or cell of a plant which has been transformed with a nucleic acid molecule according to claim 1.
44. A plant or cell of a plant which comprises a vector construct according to claim 10.
45. A plant or cell of a plant which has been transformed with a vector construct according to claim 10.
46. A plant which has been regenerated from a plant cell according to claim 41.

- | Chemical | Concentration | Temperature | Time | Yield | Purity | Characterization |
|---------------------------|---------------|-------------|------|-------|--------|------------------------|
| 1,2-Dichloroethane | 0.1 M | 25 °C | 24 h | 85% | 95% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 78% | 92% | ¹ H NMR, IR |
| 1,1,1,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 72% | 90% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 75% | 93% | ¹ H NMR, IR |
| 1,1,1,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 70% | 88% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 73% | 91% | ¹ H NMR, IR |
| 1,1,1,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 68% | 85% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 71% | 89% | ¹ H NMR, IR |
| 1,1,1,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 65% | 82% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 69% | 87% | ¹ H NMR, IR |
| 1,1,1,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 62% | 80% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 66% | 84% | ¹ H NMR, IR |
| 1,1,1,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 60% | 78% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 63% | 81% | ¹ H NMR, IR |
| 1,1,1,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 58% | 75% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 61% | 79% | ¹ H NMR, IR |
| 1,1,1,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 55% | 72% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 59% | 76% | ¹ H NMR, IR |
| 1,1,1,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 52% | 70% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 56% | 74% | ¹ H NMR, IR |
| 1,1,1,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 50% | 68% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 54% | 72% | ¹ H NMR, IR |
| 1,1,1,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 48% | 65% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 52% | 69% | ¹ H NMR, IR |
| 1,1,1,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 45% | 60% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 49% | 64% | ¹ H NMR, IR |
| 1,1,1,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 42% | 55% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 46% | 59% | ¹ H NMR, IR |
| 1,1,1,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 40% | 50% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 44% | 54% | ¹ H NMR, IR |
| 1,1,1,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 38% | 45% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 42% | 49% | ¹ H NMR, IR |
| 1,1,1,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 35% | 40% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 39% | 44% | ¹ H NMR, IR |
| 1,1,1,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 32% | 35% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 36% | 39% | ¹ H NMR, IR |
| 1,1,1,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 30% | 30% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 34% | 34% | ¹ H NMR, IR |
| 1,1,1,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 28% | 25% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 32% | 29% | ¹ H NMR, IR |
| 1,1,1,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 25% | 20% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 29% | 24% | ¹ H NMR, IR |
| 1,1,1,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 22% | 18% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 26% | 22% | ¹ H NMR, IR |
| 1,1,1,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 20% | 15% | ¹ H NMR, IR |
| 1,1,2,2-Tetrachloroethane | 0.1 M | 25 °C | 24 h | 24% | 20%</ | |

SCHEMATIC 1

SCHEMATIC OF A GENE

